UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
BONZO, BRYCE P

ART UNIT	PAPER NUMBER
2113	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>18 December 2006</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-29</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-29</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>30 January 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

Final Official Action

Status of the Claims

Claims 1, 2, 4, 8, 10-15, 17, 18, 17, 21-26 and 28 are rejected under 35 USC §102.

Claims 3, 5, 7, 6, 9, 16, 19, 20, 27 and 29 are rejected under 35 USC §103.

Rejections under 35 USC §102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 8, 10-15, 17, 18, 17, 21-26 and 28 are rejected under 35

U.S.C. 102(b) as being anticipated by Bloomquist.

As per the claims, Bloomquist discloses:

1.A method for use in an automated storage apparatus for physically moving digital data

storage units relative to at least one digital data transfer device, the method comprising:

a) recognizing a designated one of said digital data storage units as a reference

unit for diagnostic use, said unit comprising at least one storage portion (page 13, lines

5-23); and

b) using a record of data transfer operation occurrences performed relative to the

or each storage portion to limit the number of data transfer operations performed on the

or each storage portion (page 11, lines 10-11 and 15-26; page 14, lines 30 through page 15, line 2 and lines 24-28).

2. The method of claim 1, further comprising adding a data transfer operation occurrence relative to said storage portion to said record each time a data transfer operation is performed on said storage portion (page 14, lines 30 through page 15, line 2).

4. The method of claim 1, wherein said storage unit comprises a tape storage medium and a non-volatile memory device, said method further comprising storing on said non-volatile memory device at least one of (i) the data transfer operation occurrence record and (ii) information for identifying said storage unit as a designated reference unit (page 13, lines 5-23).

8. The method of claim 1, wherein the recognizing step is performed by using at least one of (i) identity information stored on said reference unit, (ii) detecting the presence of one of said reference units in a specially designated holding location, and iii) information obtained by tracking subsequent movement of the reference unit (page 13, lines 5-23).

10. A storage medium storing a program of machine readable instructions for causing a digital processor apparatus to perform the method of claim 1 (Figure 4).

11. A carrier having stored thereon a program of machine readable instructions for causing a digital processor apparatus to perform the method of claim 1 (Figure 4).

12. A logic circuit including interconnected electrically conductive elements for performing the method of claim 1 (figure 4).

13. A control apparatus for use in at least one of an automated storage apparatus or a data transfer device, said control apparatus comprising:

a) means for recognizing a digital data storage unit as a reference unit for diagnostic use, said unit comprising at least one storage portion (page 13, lines 5-23);

b) means for using a record of data transfer operation occurrences performed relative to the or each storage portion for limiting the number of data transfer operations performed on the or each storage portion (Page 14, lines 30 through column 15, lines 2 and 24-28); and

c) means for adding to said record a data transfer operation occurrence relative to said storage portion each time a data transfer operation is performed on said storage portion (page 11, lines 24-26).

14. A digital data transfer device for transferring data to and from digital data storage units, said device being arranged for:

a) recognizing a digital data storage unit as a reference unit for diagnostic use, said reference unit comprising at least one storage portion (page 13, lines 5-23);

b) accessing a record of data transfer operations performed relative to the storage portion or each said storage portions of said reference unit (page 11, lines 24-25); and

c) using said record for limiting the number of data transfer operations performed on each said storage portions (page 14, lines 30-page 15, lines 2).

15. The digital data transfer device of claim 14, wherein the device is arranged for adding to said record any occurrence of a data transfer operation by said transfer device relative to the storage portion of said reference unit or each of said storage portions of said reference unit (page 14, lines 30 through page 15, lines 2).

17. The digital data transfer device of claim 14, wherein said device is arranged to store said record on said reference unit (page 11, lines 1-26).

18. The digital data transfer device of claim 14, wherein said storage unit comprises a tape storage medium and a non-volatile memory device, and said non-volatile memory device is arranged to store said record (page 13, lines 5-23).

21. The digital data transfer device of claim 14, wherein the device is arranged for recognizing said digital data storage unit as being said designated reference unit for diagnostic use in response to at least one of (i) identity information being stored on said

reference unit and (ii) information received from a controller of automated apparatus for moving, loading and unloading storage units (page 13, lines 5-23).

22. The digital data transfer device of claim 14, arranged for use with a multi-function storage unit comprising i) a tape storage medium section having said at least one storage portion and ii) an abrasive cleaning tape section, said transfer device being arranged for recognizing said multi-function storage unit as a special type of reference unit, and for using an appropriate one of said sections of said multi-function storage unit for cleaning purposes or for reference purposes (page 13, lines 5-23).

23. A digital data storage reference unit comprising i) at least one reference data storage portion and ii) a record of the number of times a data transfer operation has been performed relative to the or each of said storage portions for enabling maintenance of the data storage portion or each of said data storage portions in a predetermined reference condition (page 13, lines 5-23).

24. The digital data storage reference unit of claim 23, further comprising a cartridge including a tape data storage medium and a fast access data storage device, said record being stored on said fast access storage device (page 13, lines 5-23).

25. The digital data storage reference unit of claim 23, comprising a cartridge carrying an elongated multi-function band wound on at least one reel, said band comprising;

a) a first length including said at least one reference data storage portion (page 10, lines 10-14); and

b) a second length comprising abrasive cleaning medium, the second length being connected to and extending longitudinally away from said first length (page 9, lines 10-27).

26. The digital data storage reference unit of claim 23, comprising identity information for enabling a digital data processor to recognize said unit as a reference unit for diagnostic use (column 13, lines 5-23).

28. A digital data transfer device for transferring data to and from digital data storage units, said device being arranged for:

a) recognizing one of said digital data storage units as a reference unit for diagnostic use, said reference unit comprising at least one storage portion (page 13, lines 5-24);

b) accessing a record of data transfer operations performed relative to said storage portion of said reference unit or each of said storage portions of said reference units (page13, lines 5-24); and

c) using said record for limiting the number of data transfer operations performed on each said storage portion (page 14, lines 30 through page 15, line 2 and lines 24-28);

d) the digital data transfer device being arranged for use with a multi-function storage unit comprising i) a tape storage medium section having said at least one storage portion (page 13, lines 5-24) and ii) an abrasive cleaning tape section (page 9, lines 10-27), said transfer device being arranged for recognizing said multi-function storage unit as a special type of reference unit (page 13, lines 5-24), and for using an appropriate one of said sections of said multi-function storage unit for cleaning purposes or for reference purposes, as required (page 13, lines 5-24).

Rejections under 35 USC §103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 7 and 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bloomquist.

Bloomquist does not explicitly disclose the use of writes followed by reads during a write operation. Official Notice is given that it is notoriously well known to those skilled to perform the "write/verify" technique in high error rate systems to ensure error detection during writes. Write/verify allows writes to be error checked immediately without any special ECC hardware. Bloomquist is specifically concerned with writes in a fault prone system, and provides multiple ways to detect and determine errors. Thus it

would have been obvious to one of ordinary skill in the art at the time of invention to incorporate the well known write/verify mechanisms routinely used in mass storage into the fault prone system of Bloomquist in order to better ensure integrity.

Bloomquist does not explicitly disclose the use of three as a limiting number. Official Notice is given that it is notoriously well known to those skilled in the art of computer sciences that three consecutive errors in a system in enough to warrant action, any extra attempts being wasted time and resources. While a single error maybe by a transient fault, errors occurring over the course of three repeated operations are generally indicative of a failure or at least warrant their investigation. Thus is would have been obvious to one of ordinary skill in the art at the time of invention would have know to incorporate the well know concept of cutting off attempts at three, in order to advance fault handling in Bloomquist thus creating a faster and more efficient cleaning system.

As per claim 29, Bloomquist discloses:

using a record of data transfer operation occurrences comprises a record of data transfer operation occurrences stored in on a specially reserved portion (page 11, memory 64).

Bloomquist does not explicitly disclose the storage portion being on the magnetic tape. Official Notice is given that it is notoriously well known to store diagnostic data on magnetic media in magnetic media systems. This is often done in disk drive where table of contents and other operation data is stored on the magnetic media itself rather

than in special solid state media. The advantaged by doing this is there are few connections required, and all the interfaces provided for the magnetic media may be reused to access control or diagnostic data. Thus it would have been obvious to one of ordinary skill in the art at the time of invention to implement the storage of Bloomquist on magnetic media, thus reducing the extra components and saving costs.

Claims 3, 5, 6, 9, 16, 19, 20 and 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bloomquist in view of Patton.

As per the claims, Patton discloses:

3. The method of claim 1, further comprising limiting to one the number of data transfer operations performed on the or each said storage portion, whereby no data transfer operation is performed on a previously used said storage portion (page 5, lines 39-41)

Bloomquist discloses a magnetic tape system with cleaning mechanisms, while Patton discloses alternate media with cleaning mechanisms. Patton is provides for a wide array of media not limited to a single form, and more importantly provides for entire libraries of storage. In many of the media of Patton, limiting the number of requests is beneficial as it prevents over use or records the instances of use for a write-once media. This it would have been obvious to one of ordinary skill in the art of data storage to incorporate the data library system of Patton in the guiding principle of Bloomquist thus creating, and more reliable automated data library.

5. The method of claim 1, further comprising automatically inserting said reference unit in said one data transfer device and performing a reference data transfer operation in response to an error level in data transferred by the transfer device on each of said transfer devices exceeding a threshold (page 5, lines 13-19).

Bloomquist discloses a magnetic tape system with cleaning mechanisms, while Patton discloses alternate media with cleaning mechanisms. Patton is provides for a wide array of media not limited to a single form, and more importantly provides for entire libraries of storage. In many of the media of Patton, limiting the number of requests is beneficial as it prevents over use or records the instances of use for a write-once media. This it would have been obvious to one of ordinary skill in the art of data storage to incorporate the data library system of Patton in the guiding principle of Bloomquist thus creating, and more reliable automated data library.

6. The method of claim 1, comprising monitoring an error level in data transferred during said reference data transfer operation, and determining thereby whether a cause of the excessive error level originates from said one data transfer device or from a said data storage unit last removed from said data transfer device (page 10, lines 30 through page 11, line 15).

Bloomquist discloses a magnetic tape system with cleaning mechanisms, while Patton discloses alternate media with cleaning mechanisms. Patton is provides for a wide array of media not limited to a single form, and more importantly provides for entire libraries of storage. In many of the media of Patton, limiting the number of requests is

beneficial as it prevents over use or records the instances of use for a write-once media. This it would have been obvious to one of ordinary skill in the art of data storage to incorporate the data library system of Patton in the guiding principle of Bloomquist thus creating, and more reliable automated data library.

9. The method of claim 1, wherein said reference unit is a multi-function storage unit comprising i) a data storage tape comprising said at least one storage portion (Bloomquist: Figure 4) and ii) a tape-cleaning band (Bloomquist: Figure 4), the method further comprising holding the multi-function storage unit in a dedicated multi-function storage unit holding area (Patton: page 6, lines 38-41), and moving said multi-function storage unit to a data transfer device for use as a cleaning unit or as a reference unit (Bloomquist: page 13, lines 5-23).

Bloomquist discloses a magnetic tape system with cleaning mechanisms, while Patton discloses alternate media with cleaning mechanisms. Patton is provides for a wide array of media not limited to a single form, and more importantly provides for entire libraries of storage. In many of the media of Patton, limiting the number of requests is beneficial as it prevents over use or records the instances of use for a write-once media. This it would have been obvious to one of ordinary skill in the art of data storage to incorporate the data library system of Patton in the guiding principle of Bloomquist thus creating, and more reliable automated data library.

16. The digital data transfer device of claim 14, wherein the device is arranged for limiting the number of data transfer operations to one per storage portion (Patton: page 5, lines 39-41), whereby a version of said storage portion is provided for any desired reference data transfer operation (Bloomquist: page 11, lines 24-25).

Bloomquist discloses a magnetic tape system with cleaning mechanisms, while Patton discloses alternate media with cleaning mechanisms. Patton is provides for a wide array of media not limited to a single form, and more importantly provides for entire libraries of storage. In many of the media of Patton, limiting the number of requests is beneficial as it prevents over use or records the instances of use for a write-once media. This it would have been obvious to one of ordinary skill in the art of data storage to incorporate the data library system of Patton in the guiding principle of Bloomquist thus creating, and more reliable automated data library.

19. The digital data transfer device of claim 14, wherein the device is arranged for monitoring error levels in data transferred by said transfer unit relative to said data storage units and, in response to detecting said error level being in excess of a predetermined threshold, for:

a) initiating i) removal of said data storage unit presently inserted in said transfer unit and ii) inserting said reference unit (page 6, lines 28-43); and b) performing a reference data transfer operation (page 6, lines 16-25).

Bloomquist discloses a magnetic tape system with cleaning mechanisms, while Patton discloses alternate media with cleaning mechanisms. Patton is provides for a

wide array of media not limited to a single form, and more importantly provides for entire

libraries of storage. In many of the media of Patton, limiting the number of requests is

beneficial as it prevents over use or records the instances of use for a write-once media.

This it would have been obvious to one of ordinary skill in the art of data storage to

incorporate the data library system of Patton in the guiding principle of Bloomquist thus

creating, and more reliable automated data library.

20. The digital data transfer device of claim 14, wherein the device is arranged for

monitoring an error level in data transferred during said reference data transfer

operation (Bloomquist: page 14, lines 30 through page 15, lines 2), and determining

whether a cause of the excessive error level is in said data transfer device or in the data

storage unit last removed from said data transfer device (Patton: page 10, lines 30

through page 11, lines 15).

Bloomquist discloses a magnetic tape system with cleaning mechanisms, while

Patton discloses alternate media with cleaning mechanisms. Patton is provides for a

wide array of media not limited to a single form, and more importantly provides for entire

libraries of storage. In many of the media of Patton, limiting the number of requests is

beneficial as it prevents over use or records the instances of use for a write-once media.

This it would have been obvious to one of ordinary skill in the art of data storage to

incorporate the data library system of Patton in the guiding principle of Bloomquist thus

creating, and more reliable automated data library.

As per claim 27, Bloomquist discloses:

27. A digital data transfer device for transferring data to and from digital data storage units, said device being arranged for:

a) recognizing one of said digital data storage units as a reference unit for diagnostic use, said reference unit comprising at least one storage portion (page 13, lines 5-24);

b) accessing a record of data transfer operations performed relative to the storage portion of said reference unit or to each of said storage portions of said reference unit (page 13, lines 5-24); and

c) using said record for limiting the number of data transfer operations performed on each of said storage portions (page 14, lines 30 through page 15, line 2 and lines 24-28); the digital data transfer device being further arranged for:

d) responding to an error level of data transferred by said transfer device relative to said data storage units being in excess of a predetermined threshold (page 14, lines 30 through page 15, line 2 and lines 24-28) for:

Patton discloses:

i) initiating a) removal of a said data storage unit presently inserted in said transfer unit (page 6, lines 28-43) and b) insertion of a said reference unit; and ii) performing a reference data transfer operation (page 6, lines 28-43).

Bloomquist discloses a magnetic tape system with cleaning mechanisms, while Patton discloses alternate media with cleaning mechanisms. Patton is provides for a

wide array of media not limited to a single form, and more importantly provides for entire libraries of storage. In many of the media of Patton, limiting the number of requests is beneficial as it prevents over use or records the instances of use for a write-once media. This it would have been obvious to one of ordinary skill in the art of data storage to incorporate the data library system of Patton in the guiding principle of Bloomquist thus creating, and more reliable automated data library.

Response to Applicants Arguments

Applicant's first and most germane argument is that Bloomquist does not disclose "a record of data transfer operations performed on a storage portion of the a storage unit". The Examiner disagrees. Page 11 clearly describes performing read/write testing on the storage area. As this a data transfer operation, on the storage portion, regards of why it was done, it meets the very broad terminology of the claims.

Applicant next argues that the "data transfer operation occurrence" yet again. As shown above, the cleaning process its contains a data transfer process, that of the read/write test.

Applicant argues, that three is not taught in the prior. The Examiner provides rationale as to why three is often considered suitably a small number for error instances to be tolerated.

Applicant further argues that the record of data transfer operation is not used to limit use of storage. The Examiner points out that once the heads are determined to be defective in the system, all processing stops and the storage portion is no longer used.

Effectively, Applicant is arguing that the data transfer operations are normal data transfer operations and not those used in a diagnostic of the head. While this difference may exist, it is most clearly not required by the claim.

Final Disposition

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryce P. Bonzo whose telephone number is (571)272-3655. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on (571)272-3645. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bryce P Bonzo
Primary Examiner
Art Unit 2113